Exhausted B cells hamper immune response to HIV

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Recent studies have shown that HIV causes a vigorous and prolonged immune response that eventually leads to the exhaustion of key immune system cells--CD4+ and CD8+ T-cells--that target HIV. These tired cells become less and less able to fight the virus, and the cells' fatigue contributes to the inability of an HIV-infected person's immune system to clear the virus from the body.

Now, researchers at the National Institute of Allergy and Infectious Diseases (NIAID), part of the National Institutes of Health, have shown that a similar type of exhaustion strikes another important brigade of immune system soldiers: the B cells that make virus-fighting proteins called antibodies.

In most HIV-infected individuals not receiving antiretroviral therapy, the virus replicates continuously, causing systemic disturbances that include changes in certain subsets of B cells that circulate in the blood. One of these subsets, known as "tissue-like memory B cells," is abundant in HIV-infected individuals who do not control their viral burden. These particular cells show signs of premature exhaustion and a reduced ability to make the high-quality antibodies needed to fight HIV.

As with studies of exhausted CD4+ and CD8+ T cells, these new findings related to exhausted B cells help illuminate the complex immune system damage caused by HIV, and the challenges to rebuilding or bolstering an HIV-infected person's immune system.

NIAID's HIV vaccine research program aims to increase the understanding of B cells to help inform the development of an effective vaccine, and this study contributes to this effort. The authors note that the design of a therapeutic vaccine designed to slow HIV disease progression will need to overcome or circumvent the challenge posed by the inability of certain exhausted B cells to make high-quality antibodies.

Source: National Institute of Allergy and Infectious Diseases